

10579,823  
On 2/23/09

**Amendments to the Specification:**

Please replace the title as follows:

**HOLOGRAPHIC MULTIPLE RECORDING METHOD**

**HOLOGRAPHIC MULTIPLEX RECORDING METHOD**

Please replace the paragraph beginning on page 2, line 15, with the following rewritten paragraph:

Due to the geometrical shape of the recorded gratings, Bragg selectivity (Bragg mismatch with respect to the amount of shift, or a moving amount at which diffraction efficiency is nearly zero when shift motion is performed by this distance from a position providing maximum diffraction efficiency) of the holograms is the highest in the X-axis direction, and (Bragg mismatch with respect to the amount of shift, or a moving amount at which diffraction efficiency is nearly zero when shift motion is performed by this distance from a position providing maximum diffraction efficiency) is several  $\mu\text{m}$  in the X-axis direction and is 100 to several hundreds  $\mu\text{m}$  in the Y-axis direction (see the abovementioned reference).

Please replace the paragraph beginning on page 5, line 14, with the following  
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rewritten paragraph:

In summary, the above-described objectives are achieved by the following aspects  
embodiments of the present invention.

Please replace the paragraph beginning on page 13, line 10, with the following  
*On 2/23/09*

rewritten paragraph:

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A holographic multiplex recording apparatus 10 is configured to include: a laser beam source 12; a beam expander 14 for expanding the beam diameter of the laser beam emitted from this laser beam source 12; a beam splitter 16 for splitting the laser beam having the beam diameter expanded by this beam expander 14 into a reference beam and an object beam; a reference optical system 22 for guiding the reference beam, which is the transmission beam of the abovementioned beam splitter 16, to a holographic recording medium 20; an object optical system 24 for guiding the object beam, which is the reflection beam of the abovementioned beam splitter 16, to the abovementioned holographic recording medium 20; an imaging optical system 26 which is arranged on a line extending the optical axis of the object beam having been projected onto the abovementioned holographic recording medium 20 via the abovementioned object optical system 24 ~~of the holographic recording medium 20~~ and having passed through the holographic recording medium 20; a position controller 28 for controlling a position with respect to the abovementioned reference beam and the abovementioned object beam; and a servo system 30 for detecting the position of the abovementioned holographic recording medium 20.

Please replace the paragraph beginning on page 21, line 6, with the following rewritten paragraph:

Subsequently, the same procedure as in that of the abovementioned first first-stage multiplex recording spot matrix  $\underline{XY}_1$  is followed to form the second-stage multiplex recording spot matrix  $\underline{XY}_2$  by shifting in the Y-axis direction by a shift amount  $\Delta Y$  as shown in Fig. 2(D). This is repeated until immediately before the total sum of the shift amount  $\Delta Y$  becomes the same as the pitch (2R) of the recording spot RS in the Y-axis direction to thereby form the last-stage multiplex recording spot matrix  $\underline{XY}_n$  (not shown). Thus, the multiplexing in the Y-axis direction is completed.

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New U.S. National Stage of PCT/JP2004/016329

Please replace the paragraph beginning on page 21, line 18, with the following *or 2/23/09*  
rewritten paragraph:

Here, the multiplexing may be completed at an earlier stage according to the amount of information to be recorded. Further, when the amount of information is previously known, the shift amount  $\Delta X$  may be increased to attempt to decrease the stroke-cross talk between pages.

Please replace the paragraph beginning on page 24, line 9, with the following *or 2/23/09*  
rewritten paragraph:

This holographic multiplex recording method forms the recording spots by repeating carrying out a first-stage X-axis direction multiplex recording step to a last-stage X-axis direction multiplex recording step.